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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/975,667	10/11/2001	Manoneet Singh	RAD295	9491
23494	7590	08/02/2005	EXAMINER	
TEXAS INSTRUMENTS INCORPORATED P O BOX 655474, M/S 3999 DALLAS, TX 75265			FAN, CHIEH M	
			ART UNIT	PAPER NUMBER
			2638	

DATE MAILED: 08/02/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/975,667

Applicant(s)

SINGH ET AL.

Examiner

Chieh M. Fan

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 04 May 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-44 is/are pending in the application.
- 4a) Of the above claim(s) 21-44 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-4 and 11-14 is/are rejected.
- 7) ☒ Claim(s) 5-10 and 15-20 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 11 October 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Election/Restrictions***

1. Claims 21-44 are withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected invention, there being no allowable generic or linking claim. Applicant timely traversed the restriction (election) requirement in the reply filed on 5/4/05.

### ***Drawings***

2. The drawings are objected to because the reference 36 in Figure 2 should be associated with "QAM SYMBOL DECODER". Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet

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submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

***Claim Rejections - 35 USC § 102***

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claims 1-3 and 11-13 are rejected under 35 U.S.C. 102(e) as being anticipated by Jung (U.S. Patent No. 6,483,553).

Regarding claim 1, Jung teaches a multicarrier signal receiver (Fig. 3A, a COFDM receiver) for receiving a serial signal sequence of modulated subcarriers carrying information for input pilot and data symbols, comprising: a subcarrier-to-symbol converter (15 in Fig. 3A) for converting said serial signal sequence into received pilot and data symbols representative of said input pilot and data symbols; and an inverse Fourier transformer for selecting said received pilot symbols from said received pilot and

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data symbols (20 in Fig. 3A) and then inverse Fourier transforming said received pilot symbols into received pilot multicarrier blocks (21 in Fig. 3A).

Regarding claim 2, said modulated subcarriers are an orthogonal frequency division multiplex (OFDM) signal (col. 2, line 22) formed by inverse Fourier transforming (inherent for a OFDM system) said input pilot and data symbols.

Regarding claim 3, the subcarrier-to-symbol converter includes a Fourier transformer for Fourier transforming a representation of said serial signal sequence to said received pilot and data symbols (15 in Fig. 3A).

Regarding claims 11-13, claims 11-13 are corresponding method claims of claims 1-3 and are therefore rejected for the same reason above.

### ***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 1-4 and 11-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Li (U.S. Patent No. 6,654,429).

Regarding claims 1 and 4, Li teaches a multicarrier signal receiver (Figs. 2 and 3, i.e., a OFDM receiver) for receiving a serial signal sequence of modulated subcarriers carrying information for input pilot and data symbols, comprising: a subcarrier-to-symbol

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converter (124 in Fig. 2) for converting said serial signal sequence into received pilot and data symbols representative of said input pilot and data symbols; and an inverse Fourier transformer for selecting said received pilot symbols from said received pilot and data symbols (142 in Fig. 3, col. 5, lines 39-42) and then inverse Fourier transforming said received pilot symbols into received pilot multicarrier blocks (150 in Fig. 3);

a pilot multicarrier generator (146 in Fig. 3) for generating a computed pilot multicarrier block having complex conjugates of system pilot symbols corresponding to said input pilot symbols (142 in Fig. 3,  $a^*[n,k]$ ); and

a correlator for correlating said received pilot symbol with said computed pilot multicarrier block for providing a correlation function (142 in Fig. 3).

The difference between Li and the claimed subject matter lies in that the correlation of Li is performed by the correlator before the inverse fast Fourier transform (IFFT), while the claimed subject matter requires that the IFFT performed before the correlation. However, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to change the order of IFFT and correlation, since it has been held that a mere reversal of the essential working parts of a device involves only routine skill in the art. *In re Einstein*, 8 USPQ 167.

Regarding claim 2, said modulated subcarriers are an orthogonal frequency division multiplex (OFDM) signal (col. 3, lines 17-20) formed by inverse Fourier transforming (106 in Fig. 1) said input pilot and data symbols.

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Regarding claim 3, the subcarrier-to-symbol converter includes a Fourier transformer for Fourier transforming a representation of said serial signal sequence to said received pilot and data symbols (124 in Fig. 2).

Regarding claims 11-14, claims 11-14 are corresponding method claims of claims 1-4 and are therefore rejected for the same reason above.

### ***Allowable Subject Matter***

7. Claims 5-10 and 15-20 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

### ***Conclusion***

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. JP 2002-111624 (see Fig. 1) and Keevil et al. (U.S. Patent No. 6,359,938, see Fig. 4 for a COFDM system).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Chieh M. Fan whose telephone number is (571) 272-3042. The examiner can normally be reached on Monday-Friday 8:00AM-5:30PM, Alternate Fridays off.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kenneth Vanderpuye can be reached on (571) 272-3078. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Chieh M Fan  
Primary Examiner  
Art Unit 2638

July 18, 2005